

## Comments on the Recent DNA Paper

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A few thoughts:

The studies show that DNA from multiple plant species and (not surprisingly) multiple persons are present on the cloth. With the latter findings, it's important to emphasize that this is not DNA isolated from bloodstains threads themselves, but from vacuumed surface dusts.

When a DNA signal is detected that correlates with a particular geographical location, India, for example, it's impossible to know from just that data exactly how or when that DNA signal got there. The authors are appropriately cautious & conservative in their conclusions.

As the authors point out, such findings could result from the manufacture of the cloth in India (workers touching the cloth) or people traveling from India to a site where the Shroud was located. For that matter, similar results could be seen if the cloth had never been in India and a person who had never lived in India touched the cloth (but had a maternal grandmother of Indian origin). A maternal lineage as mitochondrial DNA was evaluated.

If sufficient genetic differences existed among flax from different regions of the world, and DNA of the Shroud fibers themselves were able to be examined, this might provide additional info. Several molecular biologists (including those who work in plant genomics) I discussed the survival/fidelity of DNA in processed, retted, flax with a year or so ago, said they believed a sufficient signal could be present. For this to be particularly meaningful, enough genetic variation would have to exist among flax from different geographical regions - I don't know if this is the case or not. (The flax genome has been recently sequenced).

Certain plants respond to environmental selective pressures over time through mutation of specific genes or incorporation of certain sequences through viral infection, which could function as a type of marker on a relative timescale; however, the timespan is usually much greater than 700-2,000 years. Although the flax genome has been elucidated, I am not sure how much information exists regarding genetic variability there, especially in regard to genetic drift over time.

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